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On 7/9/04

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By: Camela Skelton

PATENT  
022024.000100US

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JUL 15 2004

**OFFICE OF PETITIONS**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

Kang P. Lee, et al.

Application No.: 10/034,444

Filed: December 21, 2001

For: Aerogel Powder Therapeutic Agents

Examiner: M. Haghighatian

Art Unit: 1616

DECLARATION OF

POONGUNARN MUTHUKUMARAN

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Poongunran Muthukumaran, do declare as follows:

1. I am the Manager for Intellectual property at Aspen Aerogels, Inc. starting from April 19, 2004 to present. I have a doctorate degree in Chemical Engineering and I am familiar with the patent application process through past prosecution of my own applications and my current preparation for practitioners registration examination. A copy of my Curriculum Vitae is attached as Exhibit A.

2. In the week after my starting date (April 19, 2004) and in the subsequent week I tried contacting Attorneys of record in various patent applications held and pursued by Aspen Aerogels, Inc. On April 24, 2004, Dr. Kang Lee contacted Mr. Bruce Jacobs, attorney of record on the instant application, by e-mail to inform him of my position at Aspen Aerogels, Inc. and that I will be in charge of handling all IP related matters of Aspen Aerogels, Inc. I left a voice message for Mr. Jacobs immediately after that and also followed up with e-mails on May 4 and 7, 2004 asking him to provide me with the status of all ongoing patent prosecution and specifically about any actions that need to be taken in the immediate future. I have not received a response to date with the status of all applications. He subsequently called me and told me that everything is taken care of, and he does not see any immediate issues to be addressed. When I asked him specific questions on other applications, he told me that he lost his secretary of 14 years and the new secretary, Ms. Cheryl Middleton had yet to learn how to use the docket management database. He was also not sure if the database was up to date.

3. On May 19, 2004, while I was checking the status of the instant application on the patent office website PAIR (Patent Application Information Retrieval), I was surprised to discover that the instant patent application was abandoned. I immediately communicated to the inventors and the company officials, including Dr. Kang Lee, about this discovery. Dr. Lee was surprised to learn this fact and asked me to find the circumstances surrounding this abandonment and explore the possibilities of reviving this application. I contacted Mr. Bruce Jacobs by e-mail to inquire into the reasons for abandonment and why it was not communicated to Aspen Aerogels, Inc.

4. Mr. Jacobs responded to my email through a phone call on May 19, 2004 and informed me that he only learned from me that the application was abandoned. After he inspected his records, he found the Notice of Abandonment with an Interview Summary from the Examiner attached to it. The Notice indicated abandonment for failure to respond to an Office Action mailed June 30, 2003. The Interview Summary indicates that the examiner called Mr. Jacobs' office on January 30, 2004 and talked to

Mr. Jacobs' secretary Ms. Cheryl Middleton who confirmed the abandonment of the instant application. I am not sure why Ms. Cheryl Middleton, who is not a registered practitioner, would confirm an abandonment with the Examiner.

5. During the phone call, Mr. Jacobs told me that he was not aware of the abandonment until learning about it from me. He also told me of his confusion over whether it was an abandonment or an allowance due to a box checked in the Interview Summary. He told me that the application can be revived and asked me to provide him with a response to the Office Action so that he could revive the application. When I asked him if there was a deadline for revival, he said that there is no deadline and that the sooner we respond the better it is. I subsequently learned from Dr. Kawai Lau, the patent attorney assisting Aspen Aerogels, Inc. with revival of the instant application, that revival of an application is preferably filed within 3 months of the date the applicant is notified of the abandoned status and within 1 year of the date of abandonment.


6. I was referred to Dr. Lau by Aspen Aerogels' general attorney, who I contacted after my May 19, 2004 telephone call with Mr. Jacobs. Although I am familiar with the patent procurement process, I am not familiar with the revival of abandoned applications. Dr. Lau has provided advice and assistance in preparing the necessary documentation, including the declarations, for reviving the instant application.

7. On advice from Dr. Lau, I obtained the files for the instant application from Mr. Jacobs. On reviewing the contents, I was surprised to find papers indicating that on each of October 2 and December 15, 2003, a copy of the July 3, 2003 letter to Dr. Kang Lee concerning the Office Action mailed June 30, 2003 were sent via facsimile to Dr. Lee. The copies of the letter contain an error in the title of the invention and were apparently meant as reminders of the need to respond to the Office Action. I have searched for and reviewed the files for the instant application at Aspen Aerogels, Inc. and have not found any copies of the facsimiles. I have also learned from Dr. Lee that he has no recollection of these facsimiles. It is my conclusion that the facsimiles did not reach Dr. Lee.

8. Based on the entirety of the foregoing and my discussions with Dr. Kang Lee, Dr. George Gould and Mr. Bruce Jacobs, I believe that the failure to respond to the Office Action mailed June 30, 2003 was purely unintentional. Indeed, the failure was, and is, contrary to Aspen Aerogels' expectations.

9. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the instant application or any patent issuing thereon.

Respectfully submitted,

 7/18/04  
Poongunran Muthukumaran, Ph.D.

## Poongunran Muthukumaran

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Shrewsbury, MA 01545  
Cell: 412.889.6865 Email: poongs@msn.com

### Education

B.Tech Anna University, Chennai, India Chemical Engineering  
Ph.D Auburn University, USA Chemical Engineering

### Work Experience

2004 April – Present Manager, Intellectual Property, Aspen Aerogels, Inc. Northborough, MA  
2002 April – 2004 April Manager, Particle Design R&D, Thar Technologies, Inc, Pittsburgh, PA  
2001 April – 2002 April Research Scientist, Thar Designs, Inc, Pittsburgh, PA  
1996 Sep – 2001 April Research Assistant, Department of Chemical Engineering, Auburn University  
1994 April-1994 May Engineering Trainee, Indian Organic Chemicals Ltd., Chennai, India

### Honors and Awards

Best Ph.D Student Award in Auburn University-2000, by the Chemical Engineering Department. Recipient of Presidential Research Fellowship-Auburn University, 2000, Recipient of Lakshmi Acchi overseas study Scholarship -1996. Served as a Sergeant in National Cadet Corps (NCC) in India- Indian equivalent of ROTC. Served as the organizing Secretary of EXTRACT '96, a National level symposium on Chemical Engineering and as secretary of Association of Technologists.

### Professional Associations:

Member of AIChE, AAPPS, ACS  
Chair and Co-chair in AIChE annual meetings in supercritical fluid sessions (Area 1f) 2002-2004  
Editor of Internet Open Directory Project, Section: Chemical Engineering Software

### Work responsibilities:

Interaction with the Customers: Identifying customer needs and proposing supercritical fluid based particle solutions and working with client's scientists on projects. Planning feasibility studies and supervising the execution of projects Scale-up of SAS-EM recrystallization process for micro and nanoparticles of pharmaceutical material Development of new processes by applying supercritical fluid technology to pharmaceutical Industry Dealing with Intellectual property issues, interfacing with patent attorneys and following the IP development in this area constantly. Developing a knowledge management system for effective research and development environments Assembling and leading a multidisciplinary team of researchers for in vitro and in vivo studies of anticancer nanoparticles using murine xenograft models. Identifying business and research needs in the industry and articulating appropriate approaches in business development and research strategies Project management of process/equipment development activities

### Selected Publications and Presentations:

1. Muthukumaran, P.; Gupta, R.B.; Sung, H.-D.; Shim, J.-J., "Dye Solubility in Supercritical Carbon Dioxide. Effect of Hydrogen Bonding with Co-solvents," The Korean Journal of Chemical Engineering, 16 (1),p 111-117 (1999).
2. Muthukumaran, P.; Gupta, R.B., "Solubility of Sulfur in Supercritical Water Using Raman Spectroscopy and an Equation of State," Submitted to J. Supercritical Fluids.
3. Muthukumaran, P.; Gupta, R.B.; Sung, D.-H.; Shim, J.-J., "Dye Solubility in Supercritical fluids.," AIChE 1998 Spring National Meeting, New Orleans, LA, March 8-12, 1998.
4. Muthukumaran, P.; Brinkley, R.L; Gupta, R.B; " Lattice Fluid Equation of State with Hydrogen Bonding Cooperativity ", AIChE Journal,48(2) 2002.
5. Muthukumaran, P.; Brinkley, R.L; Gupta, R.B; " An equation of state with hydrogen bond cooperativity: 1- Alkanols and Alkanol-alkane mixtures, AIChE 1999 Annual Meeting, Dallas,TX, Oct 31-Nov 5, 1999.
6. Muthukumaran, P, Gupta, R.B, " Supercritical-Water Oxidation of heteroatomic waste", presented at The 5th International Symposium on Supercritical Fluids, Atlanta, April 8-12, 2000.
7. Muthukumaran, P.; Gupta, R.B., "Sodium-Carbonate-Assisted Supercritical Water Oxidation of Chlorinated Waste,"Ind. Eng. Chem. Res., 39, 4555-4563, 2000.
8. Muthukumaran, P, Gupta, R.B, "Sodium-Carbonate Microparticle Assisted Supercritical-Water Oxidation of Waste containing Heteroatoms", to be presented at AIChE 2000 Annual meeting, Los Angeles, CA, Nov 12-17, 2000
9. Muthukumaran, P.; Gupta, R.B., " Phase Equilibria of Mixtures Containing Ionic Liquids, Carbon Dioxide and Naphthalene", Ninth International Conference on Properties and Phase Equilibria for Product and Process Design, Kurashiki, Japan, May 20- 25, 2001.

10. Muthukumar, P.; Chordia, L.; " New Developments in Supercritical Fluid based Particle formation of pharmaceutical material,Eastern Analytical Symposium, Oct 2-5, 2001.
11. Muthukumar, P.; Chordia, L.; " Scaleup considerations in supercritical antisolvent precipitation processes", Presented at AIChE Meeting Indianapolis, 2002. Submitted for publication.
12. Muthukumar, P.; Chordia, L.; Martinez, J.L; Solubility of anticancer compounds applicable to antisolvent processes: paclitaxel and camptothecin in supercritical CO<sub>2</sub> and mixtures of cosolvents and supercritical CO<sub>2</sub>, Submitted for publication. 2002.
13. Muthukumar, P.; Chordia, L; CFC/HFC as solvents for supercritical fluid particle formation of inhalable drugs, Article under legal review. 2002
14. Muthukumar, P.; Particles and Pharmaceutical quality,Pharmaceutical Formulation and quality.(in press) Patent Disclosures WO0196247: Muthukumar, P.; Gupta, R.B., Supercritical water with reduced corrosion and enhanced oxidation rate, 2001

## **PATENTS**

Pending

Utilization of solvent properties for particle formation

Method and apparatus for forming and administering fine particles

U.S. Provisional patent disclosures on topics:

Nanoparticle collection in supercritical fluid precipitation systems

Solution atomization in supercritical fluids using complex ultrasonic vibration schemes

Method for and composition of anticancer medicaments

Polymorphic Separations using Supercritical Fluids

## **Computer skills:**

1. Platforms: Unix, Win95, Win98, Windows NT, Sun Solaris and Linux.

2. Languages: Basic, Pascal, ADA-95, HTML and object oriented programming with C++ and Java, SQL, PL/SQL, ORACLE/Webdb, and familiarity with XML specifications.

3. Engineering Software: MATLAB with Simulink and Controls, optimization and Robust Control toolboxes, Mathematica, Mathcad, Aspen Plus , Engineers Aide and Hysis.

4. Process synthesis and Integration using MEN (Mass Exchanger Network) and HEN (Heat Exchanger Network).

5. CFDRC's CFD-ACE+, a comprehensive Computational Fluid Dynamics package.

Analytical and Experimental Skills: Crystal/particle engineering, reaction engineering, thermodynamics, separations, supercritical fluid phase equilibrium, process chemistry, HPLC, SFC, GC/MS, UV-Visible Spectrophotometry. Scanning Electron Microscopy (SEM) and Tunneling Electron Microscopy(TEM). FTIR, ATR-FTIR, NMR, DSC, XRD, Supercritical Fluid Processing systems. High pressure-high temperature, high vacuum-high temperature experimental apparatus ,data acquisition and relevant Control Systems.

## **Patent Skills:**

Working knowledge of patent prosecution at USPTO: Manual of patent examination procedures. Attended a couple of USPTO customer feed back conferences. Familiar with PCT laws and regulations. Understands the working of European patent office.

Thorough understanding of supercritical fluid particle formation patent landscape: Understanding of reaches and limitations of patent claims in various aspects of supercritical fluid based particle formation.

## **Business Skills:**

Engaging customers and potential business partners, identifying their technical needs and providing a sound and comprehensive supercritical solutions.

Visiting client sites and giving presentations/help identifying issues on the supercritical fluid based technologies.

Evaluating competing technologies and arriving at business and research priorities in association with the business development team.

## **Process Design/Development/scale-up Skills:**

Several crystallization processes involving supercritical fluids

Polymorph Separation/Purification through selective crystallization

Design of a supercritical fluid based nanoparticle process for continuous production

Scale-up of the process for clinical manufacturing of nanoparticles

Supercritical Fluid extraction in various configurations

Project management on Process/Equipment Development